FPV Camera Control using OSD Pin and Flight Controller

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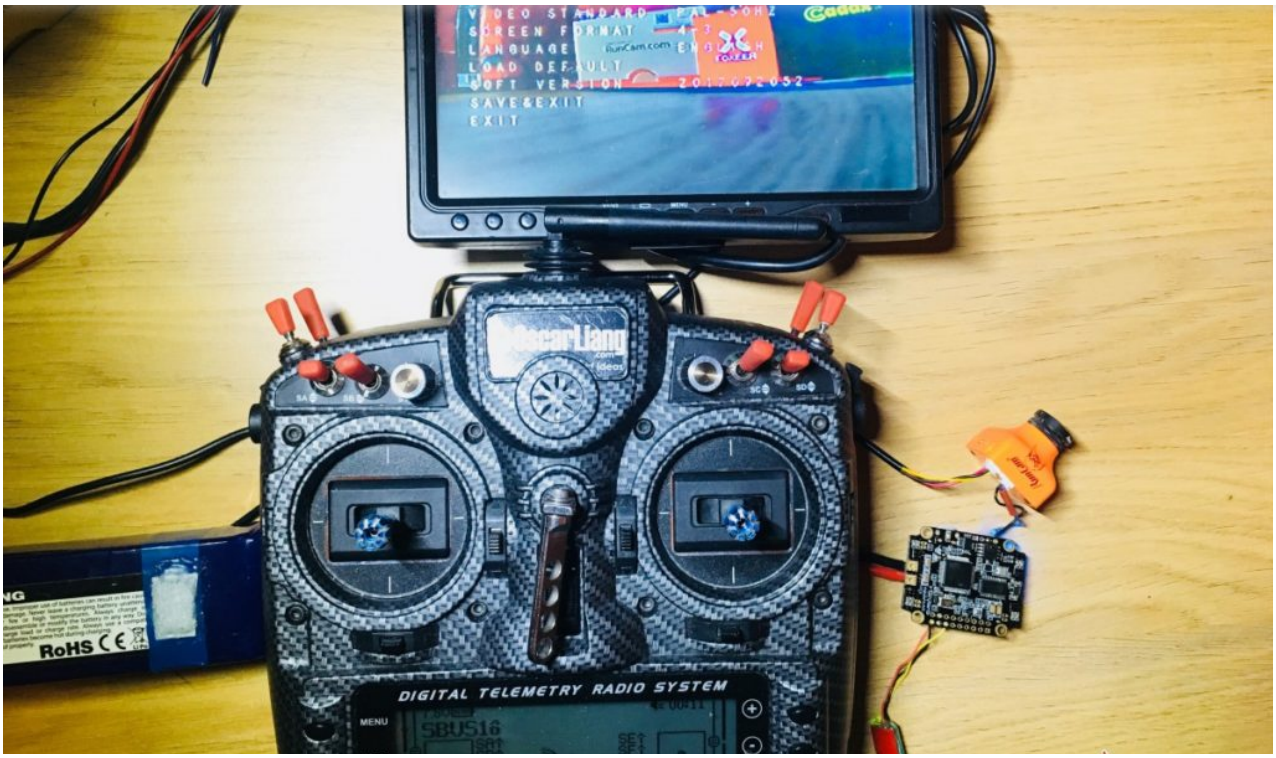
To change your FPV camera settings such as brightness, contrast, sharpness etc, you normally have t in a joystick (a.k.a OSD controller), like this:

FPV Cameras are supplied with a menu control joystick

Now, with the “Camera Control” feature in Betaflight, you can access the FPV camera settings using y radio transmitter! This is achieved by emulating OSD joystick inputs in the FC software.



Camera control allows you to access the FPV camera setting menu using your TX sticks via the FC

With Camera Control you would be able to adjust your camera settings according to the different lighti condition and environment. This allows your FPV camera to always perform well wherever you fly.

Update (March 2018): There is now another option for camera control using UART rather than t pin on the camera.

Further Reading: How to choose an FPV Camera for Drones

Hardware Setup

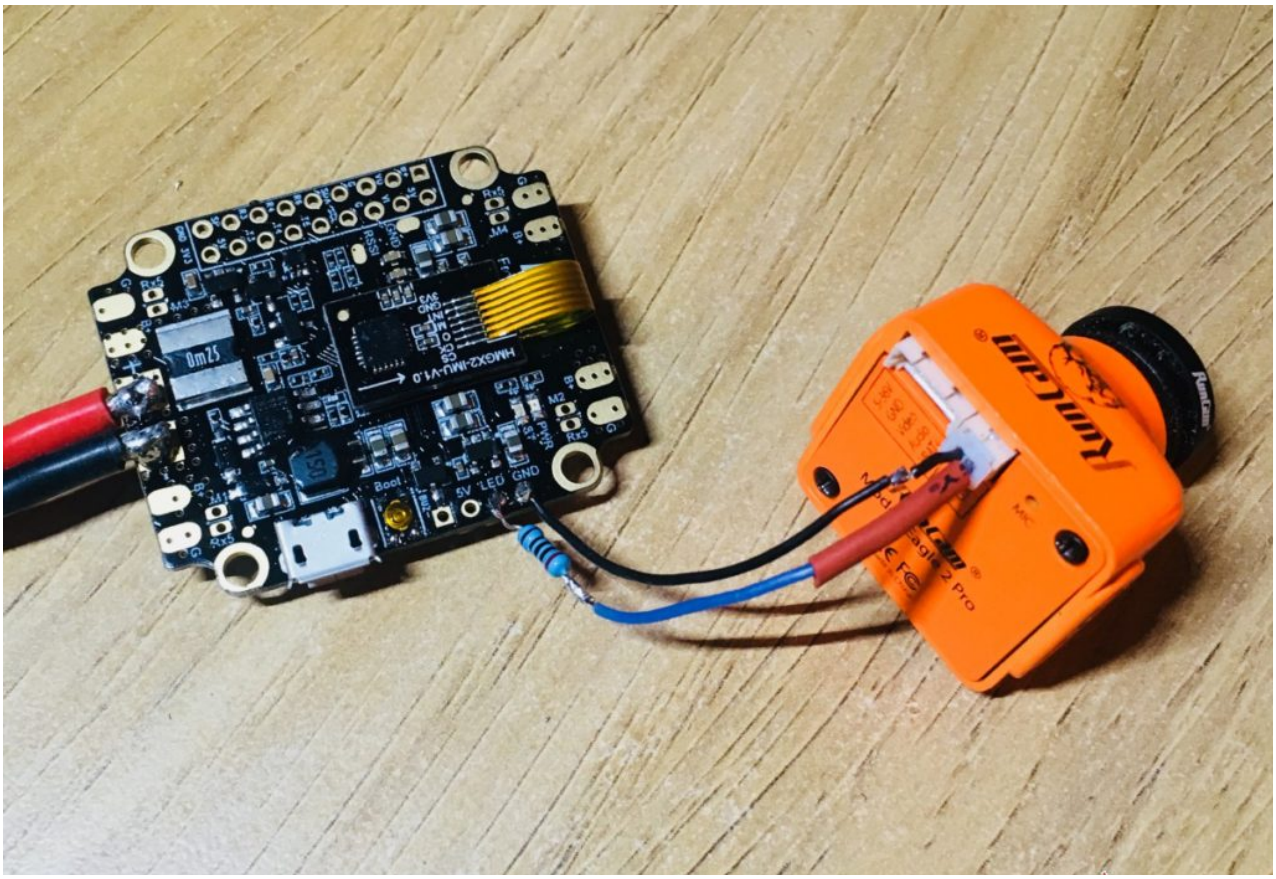
Some flight controllers offers a dedicated pin for camera control, such as the CL Racing F7. All the har is there and set up for you to use straight out of the box. If yours doesn't have this then you'd have to g the rest of this guide to set it up.

If you don't know what a timer is, don't worry about it :) Just use the **LED_Strip pin** or any spare **motor output**. These pins almost always have their own dedicated timer, and they are perfect for camera control.

Resistor and Connection

You will need to add a resistor in the connection between the FC and camera. The resistor should be 1 – 600ohm, the lower the better.

In this example, I am using a 220ohm resistor, connected to the LED_Strip pin on the FC (Kakute F4 A



Camera Control OSD Pin Connection to FC

The required resistor can be a hassle to many pilots. Therefore some FC manufacturers are beginning to add the resistor into their flight controllers. This might save you from doing it manually and everything wou

Measure Reference Voltage

Power on your camera, and measure the **voltage** between the **OSD pin and ground** with a multimete
it down somewhere, you will need to enter it in Betaflight CLI later (camera_control_ref_voltage).

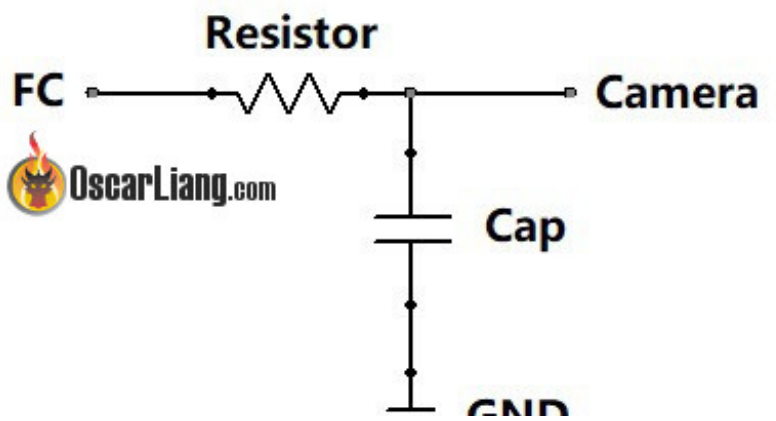
For example, I have 3.19V on my Runcam Eagle 2 Pro.

Adding Capacitor (only needed on some cameras)

Larger cameras (i.e. standard size including the Swift and HS1177) should have enough capacitance i
OSD pin to make camera control work, so a capacitor is not needed. On some micro and mini camera
might need to add an extra capacitor between **0.1uF** and **10uF**, the larger the better.

Unless your camera is known to require a capacitor, I wouldn't worry about it, only try to add the cap w
nothing works. Anyway it doesn't hurt to put one in if you insist :)

The cap should be installed on the camera's side.

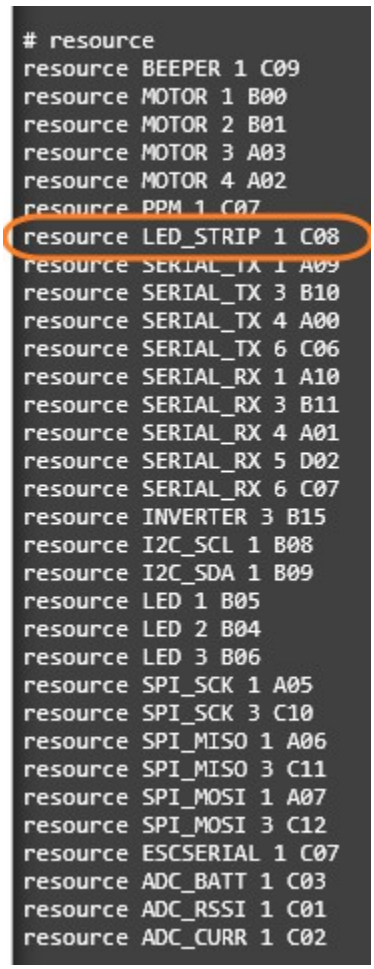


Connection of Resistor and Capacitor required for Camera Control

ested the following cameras and they all work without a capacitor: Swift, Eagle 2, Eagle 2 Pro,

Assigning Pin for Camera Control

Type "**Resource**" in CLI, and search for the pin you have connected to the camera OSD pin. In our exa it's **LED_Strip**, and **C08** is the pin number we are after.



Note: You must run the resource command to find out which pin is used for LED_STRIP, becau every FC can be different.

Copy and paste that line in the text box, and change C08 to **none**, and hit enter – this will free up the p

Camera Control Settings

There are 4 settings related to camera control, here are the default settings:

```
camera_control_mode = HARDWARE_PWM
Allowed values: HARDWARE_PWM, SOFTWARE_PWM, DAC

camera_control_ref_voltage = 330
Allowed range: 200 - 400

camera_control_key_delay = 180
Allowed range: 100 - 500

camera_control_internal_resistance = 470
Allowed range: 10 - 1000
```

camera_control_ref_voltage – Change this value to what we measured earlier using the multimeter, example we have 3.19V with the Eagle 2 Pro, so we can change it to 319.

Camera_Control_Key_Delay – You might need to adjust this parameter depends on the electrical co of the camera and your flight controller. If double-click happens when you only move the stick once, or scrolling is jittering, then increase the delay.

Camera_control_internal_resistance – It can be complicated to calculate this value, if default value work then check out the link in the Troubleshoot section.

Camera Control Using Transmitter Sticks

- Enter/Confirm – mid throttle, and yaw right
- Up/Down – Pitch stick
- t/Right – Roll stick

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19 COMMENTS

EUG

20th October 2021 - 11:59 pm

I tried hundreds of settings in Betaflight but could not get it to work. Soldered a 220 ohm re

stick full right and bingo up came the camera control menue. Seems that not having enoug on the yaw stick is an issue that might help fix things for some people.
I used the stock Betaflight camera control settings with a 330 ohm resistor spliced into the cable on a JB f4 fc and a Foxeer HS1177 camera. Hope this helps anyone who was stuck l

MARTINEZ

20th April 2021 - 9:44 pm

Hi Oscar i have Foxeer T-rex camera with Kakute F7 FC with the latest BF 4.2.8.
Kakute F7 has dedicated NC pin for that
Everything works but why to access OSD menu I need to push roll left at mid throttle instea yaw right ??
im using the Mode 2 and in Receiver BF menu everything is assigned properly.
Im missed something ?

OSCAR

21st April 2021 - 9:08 am

Because that's the camera's own OSD.
Betafligth OSD uses a different stick combo to activate, so they don't conflict.

CJ

1st December 2020 - 10:16 pm

I am curious how I disable camera control? I had this setup, but it wasn't completely workin When I would try to go into the Betaflight OSD menu, the camera's OSD menu would trigge removed camera control since it wasn't completely working and interfering with my use of t OSD menu. I see there are "Camera Control" modes in the BF modes tab, but I am not sur

Hi Oscar. Always enjoy your work, thank you.
I have camera control assigned to pin B08 in betaflight but no pad marked as camera contr
there a way to find the corresponding pad if it has a different label. Thanks.
Paul

MATHIAS

3rd February 2020 - 8:42 pm

Hi Oscar,
Why is it better to use low value resistor, such as 150Ohm, for the RC filter?

DAVID

9th January 2020 - 8:20 pm

Hello Oscar I have a speedybee f4 and it has a dac camera controll.
I also have the Foxeer mix 2
How do i make the dac camera control work with the Foxeer mix 2?
Thank you
David

OSCAR

13th January 2020 - 4:24 pm

Betaflight hasn't made DAC working yet AFAIK

COZYN

21st October 2019 - 2:09 am

20th January 2019 - 7:56 pm

so it plugs in to the camera's GND/OSD port, but is this the same as the GND/MENU port, something like the JB Micro Eagle? thanks

PATRICK G GAGNON

16th September 2018 - 10:51 pm

i'm trying to turn off my cam osd useing my taranis i can change cam settings but can't get turn off the osd.. I was in it once but don't know how i got there and was out before i could t off.. any help please..

NICK

27th April 2018 - 8:31 am

HI Oscar,
Is there another set of pins I can use on the Kakute F4 AIO v2, as I still need the LED ?

OSCAR

30th April 2018 - 4:38 pm

In your case, maybe easier to use camera control adapter that connects to the UA

BEEZWEKS

25th March 2018 - 9:03 am

How do I get in the osd menu so I can change my screen name and voltage readout… I ca into that menu. I'm using rr swift 2 cam. Does anyone know the stick command to get into t menu.

GIULIANO

28th February 2018 - 8:04 am

Hi Oscar, I've followed your tutorial and everything works until yesterday with my configurat shown below.
FC: Kakute F4 AIO V1
Mode: Hardware_pwm
Resource assignment: A01
Pad or through hole label: LED (pad)
Reference voltage: camera_control_reference_voltage. 330
Internal resistance: camera_control_internal_resistance. 470
Control key delay: camera_control_key_delay. 137 (was 125 but was too slow to respond p to stick input)
Inline register value for PWM and capacitor if software PWM: N/A
Additional comments: No resistor or cap needed. Just connected the wire from the osd (no connected either) pin on the cam, wired it to the LED pad.
Yesterday evening I've moved my VTX from T6 pad to M5 and following another your tutori soft serial I've remapped M5 pad for SmartAudio with SOFTSERIAL 1 because I've used T R6 for a gps BN-180. Well, the GPS and SmartAudio works but the camera control doesn't but if close SOFTSERIAL 1 camera control works… but obviously I can't use smart audio..
Can you give me a solution?
Thanks

MICHAEL GILLEN

12th February 2018 - 4:08 pm

Just finished a build this weekend with camera control and it works great. Luckily my FC ha

with the BF and smart audio features accessible from the TX, this gives you full control.

JOHN

6th November 2018 - 2:45 am

I tried a Runcam Swift 2 wired to the CAM_C pin of an CL Racing F4S today, runn Betaflight 3.5. I was able to access and navigate the Runcam menu, but I could nc (mid-throttle, yaw right worked everywhere but Exit?). Some actions would double begin scrolling, so the default `camera_control_key_delay` must be too low.

VOODOO614

6th February 2018 - 6:02 pm

One thing I notice is the left stick (mode 2) have to be mid throttle and yaw centered for the stick to register. Just a tip for those having some issue with right stick not working all the tir

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